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(54) **ULTRASOUND MACHINE HAVING SCALABLE RECEIVE BEAMFORMER ARCHITECTURE COMPRISING MULTIPLE BEAMFORMERS WITH COMMON COEFFICIENT GENERATOR AND RELATED METHODS**

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(57) **ABSTRACT**

An apparatus and method for generating high quality, high frame rate images in a handheld or hand-carried ultrasound imaging machine. The apparatus includes a time-multiplexed beamformer coefficient generator that supplies the necessary delay and weight coefficients to process multiple beams in parallel via a beamforming coefficient bus. This approach reduces the required hardware and power consumption to satisfy the physical space and power requirements of a hand-held probe. To improve image quality, the ultrasound machine may optionally use synthetic aperture to improve penetration and resolution. The ultrasound machine may also use pulse inversion harmonics to improve image quality by improving signal-to-noise ratio.